Public Hearing for Nonconformance Penalties for On-Highway Heavy-Duty Diesel Engines

National Vehicle and Fuels Emission Laboratory
Ann Arbor, Michigan

Testimony of Cummins Inc.

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Thank you for the opportunity to testify on the proposal to establish nonconformance penalties for heavy-duty diesel engines. My name is Dr. John Wall, and I am the Chief Technical Officer of Cummins Inc.

Headquartered in Columbus, Indiana, Cummins designs, manufactures, distributes and services engines and related technologies for a variety of applications all over the world. The company is an advocate for consistent and responsible regulations that provide environmental benefit and recognize the needs of business by offering clear direction and incentives to manufacturers that create innovative solutions.

The Heavy-Duty Highway Rule that EPA finalized in 2001 embodies these aspects. Over ten years ago, EPA and the industry started on a collaborative path to achieve near-zero emissions of particulate matter (PM) and oxides of nitrogen (NOx) for on-highway heavy-duty vehicles. The regulation provided clarity, certainty and lead-time to achieve the stringent standards. The Agency also included flexibility mechanisms to help manufacturers comply such as the ability to average, bank and trade credits and a phase-in period from 2007 through 2009 to meet the NOx standard.

Recently, EPA came to the conclusion that a manufacturer was unable able to achieve this NOx standard. As a result, the Agency is establishing Non-Conformance Penalties – or NCPs. Under the Clean Air Act, NCPs permit a manufacturer who cannot meet an emission standard for technological reasons to continue to sell non-conforming engines by paying a monetary penalty until they can comply. Importantly and as stated by EPA in their proposal, the "Clean Air Act NCP provisions require that the penalty be set at such a level that it removes any competitive disadvantage to a complying manufacturer." In other words, it should cost less to comply than not to comply. Unfortunately, EPA did not meet this requirement in the Interim Final Rule, as the penalty levels enacted are too low. This discrepancy must be addressed appropriately in the Final Rule that is the subject of this meeting.

EPA refers to the challenges of determining the penalty level in their rulemaking documents. We agree that this is complicated and requires a careful and deliberate process. That is why we are strongly opposed to EPA taking action as an Interim Final Rule without prior proposal and public comment. EPA should follow due process to allow all parties to contribute their expertise and perspective to create a sound final rule. We, along with others, have taken action on EPA's use of an Interim Final Rule process, so we will focus our comments today on the proposed rulemaking.

Cummins has unique expertise as a global engine manufacturer that gives us firsthand experience with evaluating the cost of compliance for this situation and helping the Agency determine the appropriate level for the penalties. We employ the broadest technology portfolio in the industry to meet emissions standards around the world for on and off-highway products.

The Heavy-Duty Highway Rule finalized in 2001 did not mandate any specific technology. Instead, the regulation laid out a ten year roadmap for ever tightening emission standards. Cummins evaluated each step along with customer requirements to determine the right technology approach from a suite of options. In 2002, this involved the adoption of cooled Exhaust Gas Recirculation or EGR to reduce NOx. The particulate matter standards dropped significantly in 2007 – which led to the application of diesel particulate filters or DPFs.

After achieving a 99 percent reduction in particulate matter, the next significant challenge was NOx. In 2007, Cummins was the first diesel engine manufacturer to certify a product in all 50 states to the stringent 2010 NOx standard. In partnership with Chrysler, we utilized a NOx adsorber catalyst for the 6.7L Turbo Diesel to achieve this milestone a full three years ahead of the schedule laid out by EPA.

Looking ahead to meeting the NOx standard for the rest of our engines, Cummins considered a range of technological solutions. We initially announced that we would use Selective Catalytic Reduction or SCR for our midrange engines and an EGR-only solution for heavy-duty. However, in 2008, as we continued to develop both systems, we saw significant improvements in SCR efficiency and durability for heavy-duty applications and decided to adopt SCR across all of our heavy-duty and midrange engines in the US except for the Chrysler pickup.

Thus, the question before the Agency on the cost of compliance is not an intellectual exercise for Cummins. We know exactly what it takes to change direction and adopt the technology needed to comply with the NOx standard. And we – along with our customers – could not be happier with our choice to utilize SCR.

Customer "report cards" on the 2010 launch indicate that this has been their best ever experience with emissions-driven technology change. In addition to improved reliability, the Cummins SCR system is delivering up to six percent better fuel economy than the engines we produced in 2009. Indeed, the heavy-duty on-highway engines we sell today are the most efficient engines we have ever made – at almost zero levels of NOx and particulate matter.

SCR is continuing to improve and provides a foundation for the future. We continue to improve the conversion efficiency of the SCR system – which is leading to even greater fuel economy improvements. This moves us well down the path of meeting the new greenhouse gas and fuel efficiency standards adopted by EPA and NHTSA.

Cummins SCR-equipped engines are working effectively not just in the lab but under real-world driving conditions to deliver the required NOx emission reductions. By controlling exhaust temperatures through thermal management, Diesel Exhaust Fluid or DEF is being dosed to reduce NOx emissions under a wide range of conditions, including stop-and-go, cold and lightly loaded operation. Cummins has demonstrated particulate matter and NOx control and full SCR system operation in ambient temperatures from 0 degrees to over 110 degrees Fahrenheit. Additionally, Cummins continues to work with EPA through guidance documents and certification to ensure that the operator maintains the necessary supply of DEF on the vehicle and does not interfere with the proper function of the SCR system. Separate examinations by the California Air Resources Board, American Trucking Associations, Cummins and others have all confirmed that commercial vehicle operators are not risking their time or money on trying to circumvent the SCR system.

With that being said, let's be clear that today's discussion is not about SCR versus EGR or any other technology. Cummins engines use both SCR and EGR. This is about setting the appropriate level for penalties for any manufacturer that, after more than 10 years of lead time, does not comply with EPA's NOx standard.

Cummins invested over $200 million dollars to comply, and according to media reports, heavy-duty truck prices increased by $10,000 and medium-duty truck prices increased by $6000 as the "emissions surcharge" for 2010-compliant equipment. Yet, EPA has proposed maximum penalties of only $1900 for heavy heavy-duty engines and less than $700 for medium heavy-duty engines. While the NCP calculation involves a variety of considerations, it is clear that the penalties put forth by EPA are significantly lower than what was experienced commercially.

One of the main challenges highlighted by EPA was that "compliant manufacturers have not designed and optimized in-production engines for the U.S. market at 0.50 g/hp-hr NOx (the upper limit)." This is not true. There are Cummins engines for sale at Family Emission Limits (FELs) of up to 0.50 g/hp-hr NOx using credits. These are useful, practical examples of optimization at higher NOx levels.

By reducing NOx emissions more than required in the past, Cummins generated NOx emission credits that could be applied today and in the future. This is a win for the environment because it delivered greater reductions sooner and because the credit balance is discounted before it can be "withdrawn" for use – ensuring a net absolute benefit for the environment in addition to an early benefit. Thus, we are able to certify some engines at emission levels up to 0.50 g/hp-hr NOx, we have engines at 0.35 g/hp-hr, and we have engines at 0.20 g/hp-hr. These engines are all optimized to provide the best solution for our customers taking into account cost, reliability, durability and fuel economy.

Why did we do this? At a higher NOx level, we are able to deliver even greater fuel efficiency savings for our customers.

Cummins is now fully engaged in making the technological changes necessary to reduce these engine emissions to 0.20 g/hp-hr NOx. We are advancing technology to drive down NOx while maintaining and even improving fuel efficiency. The product comparisons in this NCP rulemaking are not a hypothetical exercise for Cummins but are part of our development work going on right now in our Technical Centers. We know exactly the development, hardware, operational and other impacts of this change. Cummins provided this as confidential business information to the Agency in the months leading up to this rulemaking and will submit written comments over the next few weeks.

The Agency correctly recognizes in their NCP rulemaking that *optimized* engines at 0.50 g/hp-hr NOx and 0.20 g/hp-hr NOx must be compared. However, this is not how the analysis was conducted.

Instead of using available real-life experience as the basis for their calculation, and even though stated differently in their technical support document, EPA's analysis actually started with a *fully* compliant engine as its baseline. The Agency then backed off DEF consumption and made small hardware changes with *no change to fuel consumption* at higher NOx, creating a hypothetical 0.50 g/hp-hr NOx engine that would not be competitive in the marketplace and completely missing the point of operating at higher NOx levels. Cummins is certified at a higher NOx level and using credits specifically because of the well-known NOx-fuel consumption relationship.

Furthermore, the SCR system efficiency implicit in the EPA hypothetical non-compliant engine was far below ordinary system performance. This further distorts the cost comparison and underestimates the cost of compliance because the cost of the hardware in the hypothetical non-compliant system is too high.

Simply put, the Agency did not follow its own methodology of comparing optimized engines at both the upper limit and the standard. Since the 0.50 g/hp-hr NOx engine that EPA selected was essentially already compliant to 0.20 g/hp-hr NOx, it carried the full cost of compliance in the baseline. Thus, the EPA analysis significantly understates the cost of compliance. In effect, these penalty levels leave the cost of compliance higher than the cost of non-compliance, which is the wrong way around.

In summary, it is important to step back and look at the big picture. EPA's Heavy-Duty Highway Rule finalized in 2001 is one of the most significant environmental accomplishments of this nation. Cummins is proud to have been a partner with EPA and all US heavy-duty engine manufacturers in developing the rule, and we have delivered technologies and products that comply. We support the principle in the Clean Air Act for setting NCPs so that manufacturers who invested and are achieving the emissions standards *and their customers* should not be penalized compared to manufacturers who do not comply.

Furthermore, manufacturers, especially those with SCR-based systems which are capable of full compliance, should not be enticed to pay NCPs to produce non-compliant engines because it is more cost effective to be non-compliant instead of to comply.

And vehicle owners and operators who buy compliant engines should not be penalized compared to their competitors who purchase non-compliant engines.

EPA needs to set the NCPs at the appropriate level to ensure the cost of compliance is not greater than the cost of non-compliance. It's as simple as that.

We urge the Agency to follow due process expeditiously and finalize a sound rule that ensures all manufacturers are treated fairly, and the emissions reductions as envisioned by the landmark 2001 rule are fully realized.

Cummins appreciates the opportunity to testify today. We will provide this testimony and additional written comments to the EPA docket.

Thank you.

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